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Significance of Attitude as a Determinant of Agricultural Extension Agents' Motivation for Delivering Conservation Tillage Programs: Directions for Planning In-service Training

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Abstract

Conservation tillage systems are promoted in many parts of the world to help achieve environmental sustainability in agriculture. In-service training programs are used to educate extension agents as means to diffuse conservation tillage practices. However, changing extension agents' attitudes is a commonly overlooked factor in planning in-service training programs. Exploring the significance of attitude in conservation tillage systems in-service training is the focus of this study. The target population for this study included all agricultural and natural resource (ANR) extension agents in Georgia. This study received 62.3% response rate. Findings indicate that the agricultural extension agents have favorable attitudes towards conservation tillage systems and have fairly high level of motivation in delivering conservation tillage extension programs. Their level of motivation varies with levels of education and extension experience. Partial correlation analysis confirmed that there was a positive significant correlation between extension agents' knowledge and their motivation to present conservation tillage programs. However, there was an even stronger positive correlation between extension agents' attitudes and their motivation to present conservation tillage systems programs. This finding indicates that changing attitude is as important as changing knowledge for motivating extension agents to deliver conservation tillage systems training programs. Therefore, it is important to focus on attitude as an important training factor in planning in-service training programs.

Keywords: Attitudes, conservation, in-service, motivation, training

Appendices

A1-A34

2007, Proceedings of the 23rd Annual Conference, Volume XXIII

2006, Proceedings of the 22nd Annual Conference, Volume XXII

2005, Proceedings of the 21st Annual Conference, Volume XXI

2004, Proceedings of the 20th Annual Conference, Volume XX

2003, Proceedings of the 19th Annual Conference, Volume XIX

2002, Proceedings of the 18th Annual Conference, Volume XVIII

2001, Proceedings of the 17th Annual Conference, Volume XVII

Instrumentation

The survey questionnaire was designed by the researcher and included three major sections. The first section included an attitudinal instrument to record extension agents' attitudes toward conservation tillage. The attitudinal instrument consisted of 12 items and a 5-point Likert-type scale. All the items were negative statements about conservation tillage. The Likert-type scale consisted of the following choices: Strongly Agree=1, Agree=2, Undecided=3, Disagree=4, and Strongly Disagree=5. The extension agents' attitudes toward conservation tillage on this 12-item scale can be ranged from 12 being very negative to 60 being very positive. The second section of the instrument was designed to assess the extension agents' current knowledge about conservation tillage systems. This knowledge section consisted of 25 questions. True and false answer format was used to keep the questionnaire short. The total number of correct questions was converted into a percentage value for recording extension agents' knowledge about conservation tillage. The third section of the survey instrument was designed to record extension agents' motivation for delivering conservation tillage programs. The extension agents' levels of motivation were recorded as their frequency of presenting conservation tillage programs. The frequency of presenting conservation tillage extension programs was recorded using a 5-point Likert-type scale consisted of the following choices: 1=Never, 2=Occasionally, 3=Sometimes, 4=Often, and 5=Very often. Additionally, demographic variables such as extension agents' years of extension service and highest academic qualification were recorded.

The content and face validity of the survey instrument was determined by a panel of experts in agricultural extension and conservation tillage systems. The survey instrument was pilot tested with 12 agricultural extension agents to establish the reliability. The Cronbach's Alpha was 0.89 for the 12-item attitudinal scale.

Data collection and analysis

Data were collected via e-mail system. The survey was e-mailed as an attached Microsoft® Word document with the cover letter to the target population. They were asked to print the survey, respond, and mail in their responses to preserve their anonymity, which assured the target population could respond without any concerns. The study received 82 responses during the first e-mail of the survey. A reminding e-mail was sent to the target population three weeks after the initial e-mailing of the survey. This e-mail generated an additional 13 responses. Of the total population of 151 agricultural extension agents in Georgia, 95 responded to the survey comprising 62.3% response rate for the survey. Early and late responses were compared to address the non-response issue as Miller and Smith explained in their study (1983). The comparison indicated that there was no statistically significant difference between the early and late respondents. This confirms that the findings can be generalized for the target population.

Data analysis was conducted using SPSS® software package. Descriptive statistics such as percentages, means, and correlations were used to summarize and interpret results of the study. Partial correlation analysis was conducted to control the effect of demographic variables on extension agents' motivation for delivering conservation tillage extension programs.

Results and Findings

Respondents' years of experience ranged from one to 29 years with the mean of 17.3 years in extension. Of the respondents, 63% had a master's degree, 1% had a doctoral degree and 35% had an undergraduate degree. Extension agents' knowledge test score ranged from 40% to 84% with the mean of 64% (Table 1).

Introduction

Conservation tillage systems encompass practices of growing crops to reduce soil erosion and increase soil quality by eliminating or reducing tillage, using cover crops, and crop rotations. This combination of practices has been shown to increase soil organic matter and reduce soil erosion. Conservation tillage systems are promoted in many parts of the world to help achieve environmental sustainability in agriculture. In the United States, 41% or 113 million acres of cropland was under conservation tillage in 2004 (CTIC, 2006).

According to the Food and Agriculture Organization (FAO, 2000), diffusion of this technology has been slower in other parts of the world than in North and South America. The adoption rate of these environmentally-friendly systems is often constrained by perceptions and attitudes, as well as from a lack of technical knowledge. There is great potential for the adoption of conservation tillage practices in Africa and central Asia (F.A.O., 2000). Farmer training programs and extension agent training programs are used as means to diffuse conservation tillage practices. Improving extension agents' knowledge in conservation tillage systems is vital for them to educate farmers. Generally, extension in-service training programs focus on improving participants' knowledge. Changing participants' attitudes is a commonly overlooked factor in planning extension in-service training programs. However, increased knowledge itself may not be adequate to convince extension agents the value of conservation tillage systems. If extension agents are not convinced the value of conservation tillage system, they might not be motivated to present conservation tillage programs. Exploring the relative significance of attitude in conservation tillage systems in-service training is the focus of this research paper.

Purpose and Objectives

This research study was conducted to determine the relative significance of changing attitudes in conservation tillage systems in-service training programs designed for agricultural extension agents. The research study answers to the following specific questions:

1. What is the extension agents' current attitude toward conservation tillage systems?
2. What is extension agents' current level of motivation for delivering extension programs on conservation tillage systems?
3. Does the extension agents' motivation for delivering conservation tillage systems programs vary with their demographics such as years of experience and academic background?
4. Does the extension agents' motivation for delivering extension programs on conservation tillage systems vary with their knowledge and attitude?
5. What are the implications of extension agents' attitudes toward conservation tillage systems in planning in-service training programs?

Research Methods and Procedures

Population and sample

This was a descriptive survey research study. The target population for this study included all agricultural and natural resource (ANR) extension agents in Georgia. The list of ANR extension agents received from the University of Georgia Cooperative Extension was used as the population frame. There were 151 agricultural extension agents in the study population and all of them were surveyed. This study was done as a part of a large project of conservation tillage training needs assessment.

Other educational studies have indicated that attitudes have a strong influence on both learning and motivation to share knowledge. For instance, Ng and Bahr (2000) showed “knowledge was the key to expertise and that heuristics for problem solving did not effectively explain advanced performance.” Guagnano, Stern and Dietz (1995), explain behavior as a monotonic function of attitudes and external conditions. The results of this study and review of literature support the notion that changing extension agents’ attitudes is an important determinant of motivating them to deliver conservation tillage extension programs.

The desired outcome of conservation tillage in-service training programs is knowledgeable and highly motivated extension agents to educate farmers. Educating farmers is a knowledge transfer. The knowledge transfer is closely related to motivation and successful knowledge transfer requires a corresponding motivation management (Osterloh & Frey, 1999). This statement implies the need for managing extension agents’ motivation in transferring conservation tillage knowledge to farmers. Generally, in-service training program designers aim to improve extension agents’ knowledge and overlook the relative significance of changing or managing their attitudes. This study is important because it emphasizes the relative significance of attitude as a training component for achieving desirable results of conservation tillage in-service programs. When in-service training programs are planned, due attention should be paid to address extension agents’ attitudes towards conservation tillage for educating and motivating them to deliver effective extension programs.

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Table 1

Extension Agents' Knowledge About Conservation Tillage Systems

| Minimum Score | Maximum Score | Mean Score | SD |
|---------------|---------------|------------|--------|
| 40% | 84% | 64% | 10.447 |

Extension agents' attitudes toward conservation tillage system

The extension agents' attitudes towards conservation tillage systems ranged from 37 to 60 with the mean value of 49.1 on this scale (12=very negative, 60=very positive attitudes towards conservation tillage) (Table 2).

Table 2

Extension Agents Attitudes Towards Conservation Tillage Systems

| Value Statement About Conservation Tillage Systems | Mean | SD |
|--|------|--------|
| 1. Conservation tillage is not based on sound research. | 4.2 | 0.8378 |
| 2. Conservation tillage is just a "belief or "value" system similar to organic farming. | 4.4 | 0.5700 |
| 3. There is no sufficient research based information on conservation tillage that is applicable to cropping situations for my clients. | 4.0 | 0.7964 |
| 4. Conservation tillage may work for some crops and soils, but it is not applicable to the crops and soils in my county. | 4.0 | 0.8224 |
| 5. Conservation tillage is only a marketing ploy to sell equipment, herbicides, and GMO seed by agri-business. | 4.3 | 0.6084 |
| 6. Conservation tillage is not profitable. | 4.2 | 0.6246 |
| 7. Input costs for conservation tillage are greater than for conventional tillage. | 3.7 | 0.8019 |
| 8. There are no substantial benefits of conservation tillage to farmers. | 4.3 | 0.6748 |
| 9. I don't see any advantage of conservation tillage over conventional tillage practices. | 4.3 | 0.5796 |
| 10. Weed control is more difficult and costly with conservation tillage than conventional tillage. | 3.4 | 1.0308 |
| 11. I'm not sure what practices are considered as conservation tillage. | 3.9 | 0.8721 |
| 12. It is not possible to educate farmers so that they adopt conservation tillage practices. | 4.3 | 0.7023 |
| Overall attitude toward conservation tillage system | 49.1 | 5.8198 |

(1=Strongly Agree, 2=Agree, 3=Undecided, 4=Disagree, and 5=Strongly Disagree)

The review of data indicates that the agricultural extension agents had a fairly positive attitude towards conservation tillage systems. The distribution of extension agents' attitudes toward conservation tillage indicates that nearly 95% of the respondents had positive or very positive attitudes while only 5% had moderate level of attitudes toward conservation tillage systems. No one had negative attitudes towards conservation tillage systems based on this scale (Table 3).

Table 6

Correlations Between Extension Agents' Motivation for Delivering Conservation Tillage Programs and their Experience and Levels of Education

| Correlation Between Extension Agents' Motivation for Delivering Conservation Tillage and: | Pearson Correlation Coefficient | Significance p (2-tailed) |
|---|---------------------------------|---------------------------|
| Extension agents' years of experience | 0.179 | 0.092 |
| Extension agents' levels of education | -0.162 | 0.118 |

Above described correlations were controlled for analyzing the relationships between extension agents' motivation for delivering conservation tillage systems programs and their knowledge and attitudes. Partial correlation analysis clearly indicates that there was a strong correlation between extension agents' attitudes towards conservation tillage and their motivation to present conservation tillage systems (CTS) extension programs. Also, there was a moderately positive correlation between extension agents' knowledge and their motivation to present conservation tillage systems extension programs (Table 7).

Table 7.

Partial Correlations between Extension Agents' Motivation for Delivering Conservation Tillage Programs and their Attitude and Knowledge

| Correlation between Extension Agents' Motivation for Delivering Conservation Tillage and: | Pearson Correlation Coefficient | Significance p (2-tailed) |
|---|---------------------------------|---------------------------|
| Extension agents' levels of knowledge about CTS | 0.260 | 0.016 |
| Extension agents' attitudes towards CTS | 0.412 | 0.000 |

Conclusions and Educational Significance

Georgia Extension agents have favorable attitudes towards conservation tillage systems and have fairly high level of motivation in delivering conservation tillage extension programs. Their level of motivation varies with their levels of education and years of extension experience. The extension agents with a graduate level degree have relatively higher level of conservation tillage knowledge compared to that of the extension agents without a graduate degree. However, the graduate level educated extension agents have relatively lower motivation to present conservation tillage training programs. This finding implies that knowledge itself is not adequate to achieve desirable results of in-service training programs on conservation tillage systems.

Partial correlation analysis confirmed that there was a positive significant correlation between extension agents' knowledge and their motivation to present conservation tillage programs. However, there was an even stronger positive correlation between extension agents' attitudes and their motivation to present conservation tillage systems programs. This finding stresses that the changing extension agents' of attitude is as important as changing their knowledge for achieving desirable outcomes of conservation tillage systems in-service training programs.